

REMARKS

In the Office Action, claims 1-2, 4-6 and 9 were rejected under 35 U.S.C. §103(a) as being unpatentable over Shaw (U.S. Pat. No. 3,924,690) in view of Beccu et al. (U.S. Pat. No. 6,062,322). Claims 7 and 8 were rejected under 35 U.S.C. §103(a) as being unpatentable over Shaw in view of Beccu et al. as applies to claim 1 and further in view of Harrinton (U.S. Pat. No. 5,131,476).

Applicant agrees with the Examiner in that Shaw (U.S. Pat. No. 3,924,690) does not disclose a percussion device in which an air cushion is formed in a volume defined by an upper end of the device's drill bit, the device's drill bit bushing and the hammer end of the device's hammer piston.

However, the Examiner states (on page 4 of the Office Action) that "compressed air at the bottom of chamber 26a [of the percussive drill described by Beccu (U.S. Pat. No. 6,062,322)] will enter the seal 36 to form an air-cushioning effect formed in a volume defined by the seal, drill bit and distal hammer section". This is incorrect.

Column 5, lines 31-39 of Beccu state the following:

A bottom chamber 26 is continuously formed between the piston 16 and the seal member 36. During a downward stroke of the piston, the lower portion 16B of the piston reaches a position

shown in Fig. 1B wherein the top of the central passageway 39 of the seal member 26 is closed. At that moment, the air outlet apertures 21 in the feed tube are also closed. Thus, the bottom chamber 26a is formed which is closed to the outside. Hence, the air in the bottom chamber begins to be compressed as the piston descends farther. Eventually, the piston strikes the drill bit 13 (see Fig. 1C), whereby a bottom chamber 26b is formed.

This explicitly discloses that air in the bottom chamber 26 does not start getting compressed until the piston 16 reaches the position shown in Fig. 1B, i.e. until the lower portion 16B of the piston reaches the top of the central passageway 39 and thereby forms a volume defined by the upper end 30 of the drill bit 13, the seal member 36 and the lower portion 16B of the piston. No compressed air from the bottom chamber 26a can therefore enter the seal to form an air-cushioning effect, as the Examiner states, since the seal gets closed off from the chamber 26 before the air in the bottom chamber begins to be compressed.

Any air trapped in the volume defined by the upper end 30 of the drill bit 13, the seal member 36 and the lower portion 16B of the piston at the time the lower portion 16B closes the seal member 36 (i.e. when the piston 16 reaches the position shown in Fig. 1B) will enter the central passageway that extends through the

drill bit 13 from the upper end 30 of the drill bit 13 towards the rock surface. The air in this central passageway cannot therefore be considered to be an air cushion. Even if it were considered to be an air cushion, it would be formed in a volume defined by the passageway through the drill bit, the rock surface, the drill bit bushing and the hammer end of the device's hammer piston.

Beccu does not therefore disclose an air cushion that is formed in a volume defined by an upper end of the device's drill bit, the device's drill bit bushing and the hammer end of the device's hammer piston.

Obviousness can, as the Examiner states (on page 5 of the Office Action), only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion or motivation to do so found in the references themselves or in the knowledge available to one of ordinary skill in the art.

Shaw's percussion device solves the same problem as the percussion device according to the present invention. One of ordinary skill in the art wanting to solve this problem would therefore not need to modify the solution given by Shaw, he/she would merely adopt Shaw's solution.

Even if one of ordinary skill in the art were to combine the teaching of Shaw and Beccu, for no apparent reason, he/she would still not arrive at a percussion

device according to the present invention because neither Shaw nor Beccu disclose an air cushion that is formed in a volume defined by an upper end of the device's drill bit, the device's drill bit bushing, and the hammer end of the device's hammer piston.

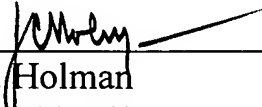
The Applicant therefore maintains that claim 1 and consequently all of the claims of the present invention are patentable over Shaw and Beccu.

Based on the foregoing amendments and remarks, it is respectfully submitted that the claims in the present application, as they now stand, patentably distinguish over the references cited and applied by the Examiner and are, therefore, in condition for allowance. A Notice of Allowance is in order, and such favorable action and reconsideration are respectfully requested.

However, if after reviewing the above amendments and remarks, the Examiner has any questions or comments, he is cordially invited to contact the undersigned attorneys.

Respectfully submitted,

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